

November 16, 2001

MEMORANDUM TO NATIONAL SCIENCE BOARD MEMBERS

SUBJECT: Preliminary Report of the November 14, 15, 2001 NSB Meeting

The major actions of the Board at its 366th meeting on November 14, 15, are summarized for the information of those members absent and as a reminder to those present.

1. Board Actions

- a. With its resolution NSB-01-207 the Board approved NSB-01-204, a statement on Guidelines for Setting Priority for Major Research Facilities (Attached).
- b. To ensure continuity when some members leave the Board in May, 2002, the Chairman named Vice-Chairs to three standing committees: Dr. Ferguson to Vice-Chair, A&O; Dr. Washington to Vice-Chair, CPP; and Dr. Natalicio to Vice-Chair, EHR.
- c. The Board approved the report, *Toward a More Effective U.S. Role in International Science and Engineering* (NSB-01-187), for printing and distribution, subject to final editorial changes by the Board Chair and the Chair of the Task Force on International S&E Issues.
- d. The Board approved the NSF Management Response to the Inspector General's Semiannual report.
- e. The Board approved selections for the 2002 Public Service Award, as recommended by the selection committee. The awardees will be notified by the NSB Chairman.

2. Awards

The Board approved the following awards:

Amount not
to exceed

GEOSCIENCES

Division of Atmospheric Sciences

The Acquisition and Integration of a Mid-size
High-Altitude Jet (HIAPER)
University Corporation for Atmospheric
Research (UCAR)

\$81,500,000
48 months

MATHEMATICAL AND PHYSICAL SCIENCES

Division of Astronomical Sciences

Authorization of the Expanded Very Large
Array (EVLA)
Associated Universities, Inc. (AUI)

\$58,983,000
This authorization
will not change the
current duration or
total spending
authority of the
current award to
Associated
Universities, Inc.

3. NSB Committees

(Committee summaries are provided by executive secretaries.)

a. Executive Committee (EC)

The Executive Committee heard reports from the Director on the status of the NSF budget and on actions being taken by NSF on security matters in the aftermath of September 11. The committee agreed to schedule a teleconference meeting in January 2002.

b. Audit & Oversight (A&O)

Regular

The Deputy Director, Dr. Bordogna, discussed the President's Management Council and Mr. David Radzanowski of OMB came as an invited guest to discuss the President's Management Agenda scorecard process. Dr. Boesz presented the OIG Semiannual Report and Dr. Bordogna provided the proposed NSF Management Response and shared copies of the NSB Chair's draft transmittal letter. The committee voted to recommend that the full Board approve the management response for transmittal to Congress. Mr. Cooley provided reports on the recent Business and Operations Advisory meeting and about addressing cost sharing risks. The committee also heard about various aspects of accountability reporting for FY2001, including: the Federal Managers Financial Integrity Act (FMFIA) and work on FY2001 Management Challenges, the Government Performance and Results Act (GPRA) Performance Report and the FY 2001 Financial Statements and EDP Audit preliminary results.

Supervisory

The committee discussed the results of an audit that was requested by Congress. The OIG presented its Performance Plan and Annual Audit Plan for FY 2002 and discussed a pilot project to locate a few auditors in a satellite office in Denver. The Committee also discussed holding a conference call before the next NSB meeting in March to discuss the OIG's Management Challenges Letter, which will be submitted in February 2002.

c. Programs and Plans (CPP)

The Committee on Programs and Plans heard reports on the management and oversight of the international Gemini telescopes project presented by Dr. Wayne Van Citters, NSF Astronomy Division Director; Mr. J. M. Oschmann, Jr., Gemini Project Manager; and Dr. C. M. Mountain, Gemini Observatory Director.

CPP considered two proposed awards and recommended approval to the full Board: The Acquisition and Integration of a Mid-Size High Altitude Jet (University Corporation for Atmospheric Research) and Authorization of the Expanded Very Large Array (EVLA) (Associated Universities, Inc.).

There was a presentation to the Committee on the recent NAS/NRC Report “U.S. Astronomy and Astrophysics: Managing an Integrated Program.” The report was prepared at the Administration’s request to assess federal support of astronomical sciences and the roles of NASA and NSF. The presentation summarized recommendations in the report and the responses developed by NSF and NASA.

The Chair of the Committee on Strategy and Budget led a discussion of guidelines for setting priorities for major research facilities. CPP also heard updates on the ongoing recompetition of NOAO management, and on the work of the Inter-American Institute for Global Change Research (IAI).

The Polar Issues Subcommittee reported on its meeting and CPP was provided with a presentation on the status of the South Pole Station Modernization (SPSM) Project. There was a brief discussion of the IceCube and ALMA projects in the context of recent Congressional action appropriating funds for construction. The Infrastructure Task Force also reported on its meeting.

d. CPP Subcommittee on Polar Issues (PI)

The subcommittee met Dr. Robert Wharton, who has joined OPP as Executive Officer; learned that the NSF Office of General Counsel is working on regulatory protection of meteorites in the Antarctic; and was given details of the FY02 OPP budget.

The subcommittee was briefed on recent activities of the Oversight Council for the International Arctic Research Center (IARC) at the University of Alaska, Fairbanks and on a recent site visit to that facility; an information item was presented regarding a change in scope and final cost-to-completion for the South Pole Station Modernization project; and the subcommittee heard a readiness review of the Neutrino detector project.

e. CPP Task Force on S&E Infrastructure (INF)

The Task Force heard testimony from the following outside visitors:

- ◆ Mr. David Radzanowski, Science and Space Branch, Office of Management and Budget
- ◆ Dr. Harley Thronson, Director of Technology, Office of Space Science, NASA

- ◆ Dr. Robin Staffin, Office of Science, Department of Energy
- ◆ Dr. Dan Atkins, University of Michigan and Chair of the NSF Advisory Committee for Cyber-infrastructure

The Task Force decided to invite representatives from the Department of Defense and the National Institutes of Health to the next INF meeting.

In closed session, the Task Force discussed recommendations for the INF report. In order to produce a draft report by the March 2002 meeting, the Task Force decided to first develop a set of draft findings and recommendations. This will be done through email and teleconferencing.

f. Education and Human Resources (EHR)

The Committee reviewed the latest draft of “The Road to Excellence: A Policy Framework for Sustained Leadership in K-16 Science, Mathematics, Engineering, and Technology Education” (NSB/EHR-01-7). This document articulates the principles the EHR Committee will use to consider policies and programs that pertain to the NSF K-16 niche. With some minor modifications, the Committee approved the report and intends to use it as an internal working document.

Dr. Ramaley briefed the Committee on the recent EHR Advisory Committee meeting, and discussed ways in which the EHR Advisory Committee might interact with the NSB/EHR Committee

Dr. Lee Zia, Program Director in the Division of Undergraduate Education, gave a progress report on the National Science, Mathematics, Engineering, and Technology Education Digital Library activities. The project is now in its second phase, focused on development and implementation of key technical and organizational infrastructure. Phase II will focus on development of user services, access services, and collections.

Dr. Ramaley briefed the Committee on NSF’s Math and Science Partnership (MSP) effort. She noted that implementation of the program will be consistent with NSF’s research-based approaches and reported that legislation for related Department of Education activities is still pending. Dr. Ramaley outlined some of the challenges involved in implementing this program. The EHR Committee plans to review the program via a teleconference early next month. Dr. Ramaley also discussed several Congressional mandates that accompanied the FY02 Appropriation with implications for current programs and MSP.

Dr. Norman Fortenberry briefed the committee on NSF's diversity efforts. An internal working group with representatives from all the directorates is compiling data and carrying out analyses of NSF’s external diversity programs and internal human resource base. A report is being developed that will document their findings and will provide input for development of future policy guidance. Mr. Lawrence Rudolph, NSF General Counsel, joined the meeting and briefed the group on diversity program approaches at NIH.

Committee members expressed an interest in hearing more about other NSF Directorates' diversity activities and asked that briefings be arranged at future meetings.

The committee then held a brief executive session.

g. EHR Subcommittee on Science and Engineering Indicators (SEI)

Mr. Rolf Lehming led a discussion of a draft September 11 statement for possible inclusion as a text box in Science and Engineering Indicators-2002. After much discussion the subcommittee recommended that the message be incorporated in the Indicators transmittal letter from Dr. Kelly to the President. Ms. Jean Pomeroy, Senior Policy Analyst, NSB Office, briefed the subcommittee on Washington's response to September 11. There was agreement that a Board statement is desirable, but that further discussions are needed to develop the specifics.

The subcommittee approved the Indicators-2002 acknowledgements statement and proposed text regarding excluded analyses in the K-12 chapter from the National Center for Education Statistics (NCES). Dr. Tapia recommended and Dr. Kelly concurred with final approval of the Orange Book. Mr. William Noxon, OLPA, updated the subcommittee on current plans for the rollout of Indicators 2002. In the current environment, he said, the relevance of key messages is particularly important and international and workforce themes will be key.

Dr. Robert Bell, SRS, updated the subcommittee on progress made thus far on the ongoing exploration of the feasibility and advisability of including a chapter on the environment in Science and Engineering Indicators-2004.

h. EHR Subcommittee on National Workforce Policies for S&E (NWP)

The three-hour meeting of the Task Force on National Workforce Policies for Science and Engineering focused on the framework for its report. The meeting began by gathering input from the NSF Assistant Directors -- their insights both on the framework and on competencies needed for the future advancement of science and engineering. Discussions explored the benefits to the country of greater participation in science and engineering by domestic students and workers, as well as the contributions of foreign students and immigrant scientists and engineers.

Members discussed the international character of science and engineering, noting that the NWP report can draw upon the upcoming report of the NSB Task Force on International Issues in Science and Engineering to set the international context. Discussion also focused on the role of teachers, parents and community members to improve student achievement at the precollege level, in order to keep the door of opportunity open for all the nation's students.

i. Committee on Strategy and Budget (CSB)

The committee discussed its role in the development of NSF budget requests. The committee has focused initial attention on the strategic issues of award size and duration, and the support of the NSF core budget in relation to support of new budget initiatives and priorities. In addition to these issues, the committee decided to focus on four other strategic issues: graduate student and

postdoctoral stipends; the environment; behavioral and social sciences, and research infrastructure.

The committee discussed NSB policies and procedures for approving new large facility projects, and the adequacy of NSF budget requests for such new research facilities. The committee, in conjunction with the Committee on Programs and Plans, developed guidelines for setting priority for major research facilities that were recommended to the full Board.

NSF staff provided an update on the status of two surveys being conducted to assess the adequacy of funding and duration of support provided under NSF research grants. In connection with the committee's deliberations on the relationship between core programs and budget initiatives, NSF staff briefed the committee on the positive influence that NSF's Information Technology Research priority area has had across the Foundation and on the development of the core programs in NSF's Computer and Information Science and Engineering Directorate

j. Task Force on International Issues in S&E (ISE)

The task force discussed comments received on the consolidated final report and responses to those comments. The task force received mostly positive comments from more than a dozen individuals. Almost all of the changes made were editorial in nature. The task force agreed to distribute to the full Board a separate Executive Summary containing all final changes, for immediate release. They also agreed to recommend the full report to the Board for final approval, subject to additional comments received from Board members by November 26th, for final approval by the task force Chair and NSB Chair.

In addition, the task force heard a presentation by Dr. Edward Murdy of the Division of International Programs on an Information Item: Furthering U.S. Interests and Leadership in ICSU—the International Council for Science.

Marta Cehelsky
Executive Officer

Attachment 1: NSB-01-207
Attachment 2: NSB-01-204

NATIONAL SCIENCE BOARD

RESOLUTION ON

GUIDELINES FOR SETTING PRIORITY FOR
MAJOR RESEARCH FACILITIES

RESOLVED, that as recommended by the NSB Committee on Strategy and Budget and the NSB Committee on Programs and Plans, the National Science Board APPROVES the statement of Guidelines for Setting Priority for Major Research Facilities, NSB-01-204. The Board will evaluate these guidelines over time.

National Science Board

**Guidelines for
Setting Priority for Major Research Facilities**

The advancement of research and education in all fields of science and engineering depends – at some times – on equipment that permits observation and experimentation. Therefore, the National Science Foundation (NSF) funds such equipment. It also funds the research necessary to advance the engineering of next generation instruments that may enable entirely new and improved modalities of observation and experimentation.

Some of the equipment that enables the advancement of research is large, complex, and costly. The term *facility* is used to describe such equipment, because typically the equipment requires special sites or buildings to house it and a dedicated staff to effectively maintain and use the equipment. Multiple experimental researchers working in related disciplines share the use of such large facilities.

From time to time, a consensus arises within a research community that a particular new facility is required to advance the state of knowledge in the field. Such a consensus matures through broad community discussion. Through that discussion, a consortium sometimes arises from the community to take the responsibility to build and operate the facility for the good of the entire community. In all cases there are clearly stated research questions that only the unique, envisioned facility could help answer.

The National Science Board approves all large facility projects, as directed by the NSF Act of 1950 and based on the Board's revised delegation of authority to the Director (NSB-99-198, Appendix B, "Delegation of Authority," 335 NSB Meeting, November 18, 1999). When considering a facility project for approval, the Board reviews the need for such a facility, the research that will be enabled, readiness of plans for construction and operation, construction budget estimates, and operations budget estimates. Construction of many facilities is funded through the NSF Major Research Equipment and Facilities Construction account.

Due to cost, not all facilities can be built at the time that their need is determined and plans are in order for construction. Some priority order on facility construction projects must be set.

The guidelines observed by the Board in approving such major facility projects and in approving the NSF budget submission are:

- Once project construction commences, highest priority is given to moving a project forward through multiple years of construction in a cost-effective way, as determined by sound engineering and as long as progress is appropriate. It is most cost-effective to complete initiated projects in a timely way, rather than to commence new projects at the cost of stretching out in-progress construction.

- New candidate projects will be considered from the point of view of broadly serving the many disciplines supported by NSF.
- Multiple projects for a single discipline, or for closely related disciplines, will be ordered based on a judgment of the contribution that they will make toward the advancement of research in those related fields. Community judgment on this matter is considered.
- Projects will be authorized close to the time that funding requests are expected to be made.
- International and interagency commitments are considered in setting priorities among projects.

The above are guidelines. Each facility consideration involves many complex issues. The Board will consider all relevant matters, and could deviate from these guidelines, given sound reasons to do so.